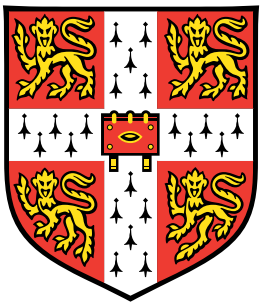
Color, Style and Composition in Image Processing



A thesis for the degree of
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Abstract

Ph.D. Thesis of Mark Grundland:
Color, Style and Composition in Image Processing

My work presents image processing techniques for facilitating artistic visual expression. Inspired by both visual art and visual perception, the aim of my research is to enhance the possibilities of visual communication by extending the repertoire of creative techniques available to digital artists. My work offers new ways to transform style, color, and composition in digital imaging. To improve control over stylized rendering, I propose a concise, multiresolution image representation that can simultaneously support both photorealistic reconstruction and non-photorealistic rendering. To improve control over color and contrast enhancement, I propose recoloring techniques to remap colors, find and replace colors, and convert colors to grayscale. To improve control over image compositing, I propose image blending operators designed to produce composites that preserve key visual characteristics of their components, including contrast, color, detail, and salience. Seeking mathematical models to express aesthetic and perceptual goals, I develop algorithmic image transformations that are shown to have a variety of practical applications across automated image rendering and interactive image editing.

Bibliography

Ades D. (1986). *Photomontage*, Thames and Hudson.

Agarwala A., Dontcheva M., Agrawala M., Drucker S., Curless B., Salesin D., and Cohen M. (2004). "Interactive Digital Photomontage," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 294-302.

Ahuja N., An B., and Schachter B. (1985). "Image Representation Using Voronoi Tessellation," *Computer Vision, Graphics, and Image Processing*, vol. 29, no. 3, pp. 286-295.

Amidror I. (2002). "Scattered Data Interpolation Methods for Electronic Imaging Systems: A Survey," *Journal of Electronic Imaging*, vol. 11, no. 2, pp. 157-176.

Anton F., Mioc D., and Fournier A. (2001). "Reconstructing 2D Images with Natural Neighbour Interpolation," *Visual Computer*, vol. 17, no. 3, pp. 134-146.

Ashikhmin M. (2003). "Fast Texture Transfer," *IEEE Computer Graphics and Applications*, vol. 23, no. 4, pp. 38-43.

Aurenhammer F. (1991). "Voronoi Diagrams - a Survey of a Fundamental Geometric Data Structure," *ACM Computing Surveys*, vol. 23, no. 3, pp. 345-405.

Baker E. and Seltzer M. (1994). "Evolving Line Drawings," *Proceedings of Graphics Interface*, Banff, Canada, pp. 91-100.

Barnsley M. F., Jacquin A., Malassenet F., Reuter L., and Sloan A. D. (1988). "Harnessing Chaos for Image Synthesis," *Proceedings of SIGGRAPH*, Atlanta, USA, pp. 131-140.

Baxter B., Scheib V., Lin M. C., and Manocha D. (2001). "Dab: Interactive Haptic Painting with 3D Virtual Brushes," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 461-468.

Beach R. and Stone M. (1983). "Graphical Style: Towards High Quality Illustrations," *Proceedings of SIGGRAPH*, Detroit, USA, pp. 127-135.

Beier T. and Neely S. (1992). "Feature-Based Image Metamorphosis," *Proceedings of SIGGRAPH*, Chicago, USA, pp. 35-42.

Bentley P. (1999). *Evolutionary Design by Computers*, Morgan Kaufmann.

Berry S. and Martin J. (1991). *Designing with Colour*, Batsford.

Bidasaria H. B. (1986). "A Method for Almost Exact Histogram Matching for Two Digitized Images," *Computer Vision, Graphics, and Image Processing*, vol. 34, no. 1, pp. 93-98.

Bockstein I. M. (1986). "Color Equalization Method and Its Application to Color Image Processing," *Journal of the Optical Society of America A*, vol. 3, no. 5, pp. 735-737.

Braun G. J. and Fairchild M. D. (1999). "Image Lightness Rescaling Using Sigmoidal Contrast Enhancement Functions," *Journal of Electronic Imaging*, vol. 8, no. 4, pp. 380-393.

Brinkmann R. (1999). *The Art and Science of Digital Compositing*, Morgan Kaufmann.

Brooks S., Cardle M., and Dodgson N. A. (2003). "Enhanced Texture Editing Using Self-Similarity," *Proceedings of Vision, Video and Graphics*, Bath, UK, pp. 231-238.

Brooks S. and Dodgson N. A. (2002). "Self-Similarity Based Texture Editing," *Proceedings of SIGGRAPH*, San Antonio, USA, pp. 653-656.

Burt P. J. (1984). "The Pyramid as Structure for Efficient Computation," *Multiresolution Image Processing and Analysis*, edited by A. Rosenfeld, Springer-Verlag, pp. 6-35.

Burt P. J. and Adelson E. H. (1983). "A Multiresolution Spline with Application to Image Mosaics," *ACM Transactions on Graphics*, vol. 2, no. 4, pp. 217-236.

Burt P. J. and Kolczynski R. J. (1993). "Enhanced Image Capture through Fusion," *Proceedings of the International Conference on Computer Vision*, Berlin, Germany, pp. 173-182.

Buzuloiu V., Mihai C., Rangayyan R. M., and Vertan C. (2001). "Adaptive-Neighborhood Histogram Equalization of Color Images," *Journal of Electronic Imaging*, vol. 10, no. 2, pp. 445-459.

Cadik M. (2004). "Human Perception and Computer Graphics," *Czech Technical University Postgraduate Study Report* DC-PSR-2004-06.

Carlsson S. (1988). "Sketch Based Coding of Grey Level Images," *Signal Processing*, vol. 15, no. 1, pp. 57-83.

Chang S.-K. and Wong Y.-W. (1978). "Optimal Histogram Matching by Monotone Gray Level Transformation," *Communications of the ACM*, vol. 21, no. 10, pp. 835-840.

Chang S.-K. and Wong Y.-W. (1980). "L_n Norm Optimal Histogram Matching and Application to Similarity Retrieval," *Computer Graphics and Image Processing*, vol. 13, no. 4, pp. 361-371.

Chang Y., Saito S., and Nakajima M. (2003). "A Framework for Transfer Colors Based on the Basic Color Categories," *Proceedings of Computer Graphics International*, Tokyo, Japan, pp. 176-181.

Cheng S.-C. and Hsia S.-C. (2003). "Fast Algorithms for Color Image Processing by Principal Component Analysis," *Journal of Visual Communication and Image Representation*, vol. 14, no. 2, pp. 184-203.

Cheng Y. (1995). "Mean Shift, Mode Seeking, and Clustering," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 17, no. 8, pp. 790-799.

Cohen M. F., Shade J., Hiller S., and Deussen O. (2003). "Wang Tiles for Image and Texture Generation," *Proceedings of SIGGRAPH*, San Diego, USA, pp. 287-294.

Collomosse J. P. and Hall P. M. (2003). "Cubist Style Rendering from Photographs," *IEEE Transactions on Visualization and Computer Graphics*, vol. 9, no. 4, pp. 443-453.

Cox I. J., Roy S., and Hingorani S. L. (1995). "Dynamic Histogram Warping of Image Pairs for Constant Image Brightness," *Proceedings of the International Conference on Image Processing*, Washington, USA, vol. 2, pp. 366-369.

Cui G., Luo M. R., Rigg B., Roesler G., and Witt K. (2002). "Uniform Colour Spaces Based on the Din99 Colour-Difference Formula," *Color Research and Application*, vol. 27, no. 4, pp. 282-290.

Cuisenaire O. and Macq B. (1999). "Fast Euclidean Distance Transformation by Propagation Using Multiple Neighborhoods," *Computer Vision and Image Understanding*, vol. 76, no. 2, pp. 163-172.

Curtis C. J. (1999). "Non-Photorealistic Animation," *Non-Photorealistic Rendering*, edited by S. Green, SIGGRAPH 1999 Course Notes, vol. 17, ACM.

Curtis C. J., Anderson S. E., Seims J. E., Fleischer K. W., and Salesin D. H. (1997). "Computer-Generated Watercolor," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 421-430.

Dale-Jones R. and Tjahjadi T. (1992). "Four Algorithms for Enhancing Images with Large Peaks in Their Histogram," *Image and Vision Computing*, vol. 10, no. 7, pp. 495-507.

Danielsson P. E. (1980). "Euclidean Distance Mapping," *Computer Graphics and Image Processing*, vol. 14, no. 3, pp. 227-248.

Darsa L. and Costa B. (1996). "Multiresolution Representation and Reconstruction of Adaptively Sampled Images," *Proceedings of SIBGRAPI*, Caxambu, Brazil, pp. 321–328.

Davoine F. and Chassery J. M. (1994). "Adaptive Delaunay Triangulation for Attractor Image Coding," *Proceedings of the International Conference on Pattern Recognition*, Jerusalem, Israel, vol. 1, pp. 801-803.

DeCarlo D. and Santella A. (2002). "Stylization and Abstraction of Photographs," *Proceedings of SIGGRAPH*, San Antonio, USA, pp. 769-776.

Deussen O., Hiller S., van Overveld C., and Strothotte T. (2000). "Floating Points: A Method for Computing Stipple Drawings," *Proceedings of EUROGRAPHICS*, Interlaken, Switzerland, pp. C41-C50. *Computer Graphics Forum*, vol. 19, no. 3, pp. C41-C50, 2000.

Devroye L. (1997). "Universal Smoothing Factor Selection in Density Estimation: Theory and Practice," *Test*, vol. 6, pp. 223-320.

Di Blasi G. and Gallo G. (2005). "Artificial Mosaics," *Visual Computer*, vol. 21, no. 6, pp. 373-383.

Dobashi Y., Haga T., Johan H., and Nishita T. (2002). "A Method for Creating Mosaic Images Using Voronoi Diagrams," *Proceedings of EUROGRAPHICS: Short Presentations*, Saarbrücken, Germany, pp. 341-348.

Douglas S. A. and Kirkpatrick A. E. (1999). "Model and Representation: The Effect of Visual Feedback on Human Performance in a Color Picker Interface," *ACM Transactions on Graphics*, vol. 18, no. 2, pp. 96-127.

Du Q., Faber V., and Gunzburger M. (1999). "Centroidal Voronoi Tessellations: Applications and Algorithms," *SIAM Review*, vol. 41, no. 4, pp. 637-676.

Duff T. (1979). "Smoothly Shaded Renderings of Polyhedral Objects on Raster Displays," *Proceedings of SIGGRAPH*, Chicago, USA, pp. 270-275.

Durand F. (2002). "An Invitation to Discuss Computer Depiction," *Proceedings of the Second International Symposium on Non-photorealistic Animation and Rendering*, Annecy, France, pp. 111-124.

Durand F., Ostromoukhov V., Miller M., Duranleau F., and Dorsey J. (2001). "Decoupling Strokes and High-Level Attributes for Interactive Traditional Drawing," *Proceedings of the EUROGRAPHICS Workshop on Rendering*, London, UK. Rendering Techniques 2001, pp. 71-82.

Ebert D. S., Musgrave F. K., Peachey D., Perlin K., and Worley S. (1998). *Texturing & Modeling*, 2 ed., AP Professional.

Efros A. A. and Freeman W. T. (2001). "Image Quilting for Texture Synthesis and Transfer," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 341-346.

Egger O., Fleury P., Ebrahimi T., and Kunt M. (1999). "High-Performance Compression of Visual Information - a Tutorial Review, Part I: Still Pictures," *Proceedings of the IEEE*, vol. 87, no. 6, pp. 974-1013.

Elber G. and Wolberg G. (2003). “Rendering Traditional Mosaics,” *Visual Computer*, vol. 19, no. 1, pp. 67-78.

Eldar Y., Lindenbaum M., Porat M., and Zeevi Y. Y. (1997). “The Farthest Point Strategy for Progressive Image Sampling,” *IEEE Transactions on Image Processing*, vol. 6, no. 9, pp. 1305-1315.

Farup I. and Hardeberg J. Y. (2002). “Interactive Color Gamut Mapping,” *International Printing and Graphics Arts Conference*, Bordeaux, France.

Faugeras O. D. (1979). “Digital Color Image Processing within the Framework of a Human Visual Model,” *IEEE Transactions on Acoustics, Speech, and Signal Processing*, vol. 27, no. 4, pp. 380-393.

Finkelstein A. and Range M. (1998). “Image Mosaics,” *Electronic Publishing, Artistic Imaging and Digital Typography*, St-Malo, France. Lecture Notes in Computer Science, vol. 1375, pp. 11-22. Proceedings of the 7th International Conference on Electronic Publishing and the 4th International Conference on Raster Imaging and Digital Typography.

Frank M. J. (1979). “On the Simultaneous Associativity of F(X,Y) and X+Y-F(X,Y),” *Aequationes Mathematicae*, vol. 19, no. 2-3, pp. 194-226.

Frei W. (1977). “Image Enhancement by Histogram Hyperbolization,” *Computer Graphics and Image Processing*, vol. 6, no. 3, pp. 286-294.

Gillespie A. R., Kahle A. B., and Walker R. E. (1986). “Color Enhancement of Highly Correlated Images. I. Decorrelation and HSI Contrast Stretches,” *Remote Sensing of Environment*, vol. 20, no. 3, pp. 209-235.

Glassner A. (1995). *Principles of Digital Image Synthesis*, vol. 1, Morgan Kaufmann.

Glassner A. (1998a). “Aperiodic Tiling Computer Graphics,” *IEEE Computer Graphics and Applications*, vol. 18, no. 3, pp. 83-90.

Glassner A. (1998b). “Penrose Tiling,” *IEEE Computer Graphics and Applications*, vol. 18, no. 4, pp. 78-86.

Glassner A. (2002). “Getting the Picture,” *IEEE Computer Graphics and Applications*, vol. 22, no. 5, pp. 76-85.

Glassner A. (2003). “Image Search and Replace,” *IEEE Computer Graphics and Applications*, vol. 23, no. 3, pp. 80-88.

Goldman R. (2003). “Deriving Linear Transformations in Three Dimensions,” *IEEE Computer Graphics and Applications*, vol. 23, no. 3, pp. 66-71.

Gonzalez R. C. and Fittes B. A. (1977). “Gray-Level Transformations for Interactive Image Enhancement,” *Mechanism and Machine Theory*, vol. 12, no. 1, pp. 111-122.

Gonzalez R. C. and Woods R. E. (2002). *Digital Image Processing*, 2 ed., Prentice Hall.

Gooch A. A., Olsen S. C., Tumblin J., and Gooch B. (2005). “Color2Gray: Salience-Preserving Color Removal,” *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 634-639.

Gooch B., Coombe G., and Shirley P. (2002). “Artistic Vision: Painterly Rendering Using Computer Vision Techniques,” *Proceedings of the Second International Symposium on Non-photorealistic Animation and Rendering*, Annecy, France, pp. 53-58.

Gooch B. and Gooch A. (2001). *Non-Photorealistic Rendering*, A K Peters.

Goodman-Strauss C. (1999). "Aperiodic Hierarchical Tilings," *Foams, Emulsions, and Cellular Materials*, edited by N. Rivier, Proceedings of NATO-ASI, vol. E 354, Kluwer, pp. 481-496.

Gotsman C. and Allebach J. P. (1996). "Bounds and Algorithms for Dither Screens," *Human Vision and Electronic Imaging*, San Jose, USA. Proceedings of SPIE, vol. 2657, pp. 483-492.

Green S. (1999). "Introduction to Non-Photorealistic Rendering," *Non-Photorealistic Rendering*, edited by S. Green, SIGGRAPH 1999 Course Notes, vol. 17, ACM.

Greenfield G. R. (2000). "Evolving Expressions and Art by Choice," *Leonardo*, vol. 33, no. 2, pp. 93-99.

Greenfield G. R. and House D. H. (2003). "Image Recoloring Induced by Palette Color Associations," *Journal of WSCG*, vol. 11, no. 1, pp. 189-196.

Gregory J. A. and Delbourgo R. (1982). "Piecewise Rational Quadratic Interpolation to Monotonic Data," *IMA Journal of Numerical Analysis*, vol. 2, pp. 123-130.

Grundland M. (1997). *Voronoimage: A Stained Glass Workshop*, Computational Geometry Project, McGill University. http://www.eyemaginary.com/VoronoImage/.

Grundland M. and Dodgson N. A. (2004a). "Automatic Contrast Enhancement by Histogram Warping," *International Conference on Computer Vision and Graphics*, Warsaw, Poland. Computational Imaging and Vision, vol. 32, pp. 293-300.

Grundland M. and Dodgson N. A. (2004b). "Interactive Contrast Enhancement by Histogram Warping," *International Conference on Computer Vision and Graphics*, Warsaw, Poland. Computational Imaging and Vision, vol. 32, pp. 832-838.

Grundland M. and Dodgson N. A. (2005a). "Color Histogram Specification by Histogram Warping," *Color Imaging X: Processing, Hardcopy, and Applications*, San Jose, USA. Proceedings of SPIE, vol. 5667, pp. 610-621.

Grundland M. and Dodgson N. A. (2005b). "Color Search and Replace," *Proceedings of the Workshop on Computational Aesthetics in Graphics, Visualization and Imaging*, Girona, Spain. Computational Aesthetics 2005, pp. 101-109.

Grundland M. and Dodgson N. A. (2007). "Decolorize: Fast, Contrast Enhancing, Color to Grayscale Conversion," *Pattern Recognition*, vol. 40, no. 11, pp. 2891-2896.

Grundland M., Gibbs C., and Dodgson N. A. (2005). "Stylized Rendering for Multiresolution Image Representation," *Human Vision and Electronic Imaging X*, San Jose, USA. Proceedings of SPIE, vol. 5666, pp. 280-292.

Grundland M., Gibbs C., and Dodgson N. A. (2007). "Stylized Multiresolution Image Representation." To appear in *Journal of Electronic Imaging*.

Grundland M., Vohra R., Williams G. P., and Dodgson N. A. (2006a). "Cross Dissolve without Cross Fade: Preserving Contrast, Color and Salience in Image Compositing," *Proceedings of EUROGRAPHICS*, Vienna, Austria, pp. 577-586. *Computer Graphics Forum*, vol.25, no.3, pp. 577-586, 2003.

Grundland M., Vohra R., Williams G. P., and Dodgson N. A. (2006b). "Nonlinear Multiresolution Image Blending," *International Conference on Computer Vision and Graphics*, Warsaw, Poland. To appear in *Machine Graphics & Vision*.

Guan S.-S. and Luo M. R. (1999). "A Colour-Difference Formula for Assessing Large Colour Differences," *Color Research and Application*, vol. 24, no. 5, pp. 344-355.

Guo L. J. (1991). "Balance Contrast Enhancement Technique and Its Application in Image Colour Composition," *International Journal of Remote Sensing*, vol. 12, no. 10, pp. 2133-2151.

Haeberli P. (1990). “Paint by Numbers: Abstract Image Representations,” *Proceedings of SIGGRAPH*, Dallas, USA, pp. 207-214.

Haeberli P. and Voorhies D. (1994). “Image Processing by Linear Interpolation and Extrapolation,” *IRIS Universe Magazine*, vol. 28, no. Aug, pp. 8-9.

Hall E. L. (1974). “Almost Uniform Distributions for Computer Image Enhancement,” *IEEE Transactions on Computers*, vol. 23, no. 2, pp. 207-208.

Hanbury A. G. and Serra J. (2001). “Morphological Operators on the Unit Circle,” *IEEE Transactions on Image Processing*, vol. 10, no. 12, pp. 1842-1850.

Hardeberg J. Y., Farup I., Kolas O., and Stjernvang G. (2002). “Color Management for Digital Video: Color Correction in the Editing Phase,” *International IARIGAI Research Conference*, Lake of Lucerne, Switzerland.

Hausner A. (2001). “Simulating Decorative Mosaics,” *Proceedings of SIGGRAPH*, New York, USA, pp. 573 - 580.

Hausner A. (2005). “Pointillist Halftoning,” *Proceedings of the International Conference on Computer Graphics and Imaging*, Honolulu, USA, pp. 134-139.

Hays J. and Essa I. (2004). “Image and Video Based Painterly Animation,” *Proceedings of the Third International Symposium on Non-photorealistic Animation and Rendering*, Annecy, France, pp. 113-120.

He T., Hong L., Kaufman A., and Pfister H. (1996). “Generation of Transfer Functions with Stochastic Search Techniques,” *Proceedings of the IEEE Visualization Conference*, San Francisco, USA, pp. 227-234.

Healey C. G. and Enns J. T. (2002). “Perception and Painting: A Search for Effective, Engaging Visualizations,” *IEEE Computer Graphics and Applications*, vol. 22, no. 2, pp. 10-15.

Heeger D. J. and Bergen J. R. (1995). “Pyramid-Based Texture Analysis/Synthesis,” *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 229-238.

Herman I. and Duke D. (2001). “Minimal Graphics,” *IEEE Computer Graphics and Applications*, vol. 21, no. 6, pp. 18-21.

Hertzmann A. (1998). “Painterly Rendering with Curved Brush Strokes of Multiple Sizes,” *Proceedings of SIGGRAPH*, Orlando, USA, pp. 453-460.

Hertzmann A. (2001). “Paint by Relaxation,” *Proceedings Computer Graphics International*, Geneva, Switzerland, pp. 47-54. New York University Technical Report 2000-801.

Hertzmann A. (2003). “A Survey of Stroke-Based Rendering,” *IEEE Computer Graphics and Applications*, vol. 23, no. 4, pp. 70-81.

Hertzmann A., Jacobs C. E., Oliver N., Curless B., and Salesin D. H. (2001). “Image Analogies,” *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 327-340.

Hertzmann A. and Perlin K. (2000). “Painterly Rendering for Video and Interaction,” *Proceedings of the First International Symposium on Non-photorealistic Animation and Rendering*, Annecy, France, pp. 7-12.

Hilger F. and Ney H. (2001). “Quantile Based Histogram Equalization for Noise Robust Speech Recognition,” *Proceedings of EUROSPEECH*, Aalborg, Denmark, vol. 2, pp. 1135-1138.

Hiller S., Deussen O., and Keller A. (2001). “Tiled Blue Noise Samples,” *Proceedings of Vision, Modeling and Visualization*, Stuttgart, Germany, pp. 265-271.

Hiller S., Hellwig H., and Deussen O. (2003). "Beyond Stippling - Methods for Distributing Objects on the Plane," *Proceedings of EUROGRAPHICS*, Granada, Spain, pp. 515-522. *Computer Graphics Forum*, vol.22, no.3, pp. 515-522, 2003.

Hoff K. E., II, Culver T., Keyser J., Ming L., and Manocha D. (1999). "Fast Computation of Generalized Voronoi Diagrams Using Graphics Hardware," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 277-286.

Hummel R. A. (1975). "Histogram Modification Techniques," *Computer Graphics and Image Processing*, vol. 4, no. 3, pp. 209-224.

Hyvärinen A., Karhunen J., and Oja E. (2001). *Independent Component Analysis*, Wiley.

Inoue A. and Tajima J. (1997). "Selective Color Correction for Arbitrary Hues," *Proceedings of the International Conference on Image Processing*, Santa Barbara, USA, vol. 3, pp. 38-41.

Itti L., Koch C., and Niebur E. (1998). "A Model of Saliency-Based Visual Attention for Rapid Scene Analysis," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 20, no. 11, pp. 1254-1259.

Jaksa R., Nakano S., and Takagi H. (2003). "Image Filter Design with Interactive Evolutionary Computation," *Proceedings of the IEEE International Conference on Computational Cybernetics*, Siofok, Hungary, pp. 1-6.

Jolliffe I. T. (1986). *Principal Component Analysis*, Springer-Verlag.

Joung-Youn K., Lee-Sup K., and Seung-Ho H. (2001). "An Advanced Contrast Enhancement Using Partially Overlapped Sub-Block Histogram Equalization," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 11, no. 4, pp. 475-484.

Jourlin M. and Pinoli J. C. (2001). "Logarithmic Image Processing," *Advances in Imaging and Electron Physics*, vol. 115, pp. 129-195.

Kaplan C. S. (1999). "Voronoi Diagrams and Ornamental Design," *Proceedings of the First Annual Symposium of the International Society for the Arts, Mathematics, and Architecture (ISAMA '99)*, San Sebastián, Spain, pp. 277-283.

Katoh N., Ito M., and Ohno S. (1999). "Three-Dimensional Gamut Mapping Using Various Color Difference Formulae and Color Spaces," *Journal of Electronic Imaging*, vol. 8, no. 4, pp. 365-379.

Kautsky J., Nichols N. K., and Jupp D. L. B. (1984). "Smoothed Histogram Modification for Image Processing," *Computer Vision, Graphics, and Image Processing*, vol. 26, no. 3, pp. 271-291.

Kim J. and Pellacini F. (2002). "Jigsaw Image Mosaics," *Proceedings of SIGGRAPH*, San Antonio, USA, pp. 657-664.

Kim K.-M., Kim J.-Y., Kim H.-S., and Ha Y.-H. (2001). "Natural Color Reproduction of an Image with Highlights by Vector Transformation and Nonlinear Mapping," *Journal of Imaging Science and Technology*, vol. 45, no. 2, pp. 100-106.

Klassen R. V. (2000). "Filtered Jitter," *Computer Graphics Forum*, vol. 19, no. 4, pp. 223-230.

Klein A., Sloan P.-P., Colburn A., Finkelstein A., and Cohen M. F. (2001). "Video Cubism," *Microsoft Research Technical Report* MSR-TR-2001-45.

Kovacs L. and Sziranyi T. (2004a). "Coding of Stroke-Based Animations," *Posters Proceedings of the WSCG International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision*, Plzen, Czech Republic, pp. 81-84.

Kovacs L. and Sziranyi T. (2004b). "Efficient Coding of Stroke-Rendered Paintings," *Proceedings of the International Conference on Pattern Recognition*, Cambridge, UK, vol. 2, pp. 835-838.

Kowalski M. A., Markosian L., Northrup J. D., Bourdev L., Barzet R., Holden L. S., and Hughes J. F. (1999). "Art-Based Rendering of Fur, Grass, and Trees," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 433-438.

Kriesberg I. (1992). *Working with Color*, Van Nostrand Reinhold.

Kuehni R. G. (2003). *Color Space and Its Divisions*, Wiley-Interscience.

Kurlander D. and Bier E. A. (1988). "Graphical Search and Replace," *Proceedings of SIGGRAPH*, Atlanta, USA, pp. 113-120.

Kwatra V., Schodl A., Essa I., Turk G., and Bobick A. (2003). "GraphCut Textures: Image and Video Synthesis Using Graph Cuts," *Proceedings of SIGGRAPH*, San Diego, USA, pp. 277-286.

Lansdown J. and Schofield S. (1995). "Expressive Rendering: A Review of Nonphotorealistic Techniques," *IEEE Computer Graphics and Applications*, vol. 15, no. 3, pp. 29-37.

Leu J.-G. (1992). "Image Contrast Enhancement Based on the Intensities of Edge Pixels," *CVGIP: Graphical Models and Image Processing*, vol. 54, no. 6, pp. 497-506.

Levin A., Lischinski D., and Weiss Y. (2004). "Colorization Using Optimization," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 689-694.

Litwinowicz P. (1997). "Processing Images and Video for an Impressionist Effect," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 407-414.

Lucchese L. and Mitra S. K. (2001). "A New Method for Color Image Equalization," *Proceedings of the International Conference on Image Processing*, Thessaloniki, Greece, vol. 1, pp. 133-136.

Maerz A. J. and Paul M. R. (1930). *A Dictionary of Color*, 1 ed., McGraw-Hill.

Markosian L., Meier B. J., Kowalski M. A., Holden L. S., Northrup J. D., and Hughes J. F. (2000). "Art-Based Rendering with Continuous Levels of Detail," *Proceedings of the First International Symposium on Non-photorealistic Animation and Rendering*, Annecy, France, pp. 59-66.

Marks J., Andalman B., Bearsley P. A., Freeman W., Gibson S., Hodgins J., Kang T., Mirtich B., Pfister H., Ruml W., Ryall K., Seims J., and Shieber S. (1997). "Design Galleries: A General Approach to Setting Parameters for Computer Graphics and Animation," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 389-400.

Masakova Z. (1998). *Confronting Quasicrystal Experiments with a Rigorous Model*, Masters Thesis, Czech Technical University.

Masakova Z., Patera J., and Zich J. (2005). "Classification of Voronoi and Delone Tiles of Quasicrystals III: Decagonal Acceptance Window of Any Size," *Journal of Physics A*, vol. 38, no. 9, pp. 1947-1960.

Massey M. and Bender W. (1996). "Salient Stills: Process and Practice," *IBM Systems Journal*, vol. 35, no. 3-4, pp. 557-573.

McCann J. J. (1999). "Color Spaces for Color-Gamut Mapping," *Journal of Electronic Imaging*, vol. 8, no. 4, pp. 354-364.

McCool M. and Fiume E. (1992). "Hierarchical Poisson Disk Sampling Distributions," *Proceedings of Graphics Interface*, Vancouver, Canada, pp. 94-105.

Meier B. J. (1996). “Painterly Rendering for Animation,” *Proceedings of SIGGRAPH*, New Orleans, USA, pp. 477-484.

Meier B. J., Spalter A. M., and Karelitz D. B. (2004). “Interactive Color Palette Tools,” *IEEE Computer Graphics and Applications*, vol. 24, no. 3, pp. 64-72.

Mese M. and Vaidyanathan P. P. (2001). “Optimal Histogram Modification with MSE Metric,” *IEEE International Conference on Acoustics, Speech, and Signal Processing*, Salt Lake City, USA, vol. 3, pp. 1665-1668.

Mezei L., Puzin M., and Conroy P. (1974). “Simulation of Patterns of Nature by Computer Graphics,” *Information Processing 74: Proceedings of IFIP Congress*, Stockholm, Sweden, pp. 861-865.

Mitsa T. and Parker K. J. (1992). “Digital Halftoning Technique Using a Blue-Noise Mask,” *Journal of the Optical Society of America A*, vol. 9, no. 11, pp. 1920-1929.

Mizuno S., Okada M., and Toriwaki J. (1998). “Virtual Sculpting and Virtual Woodcut Printing,” *Visual Computer*, vol. 14, no. 2, pp. 39-51.

Mlsna P. A., Qiang Z., and Rodriguez J. J. (1996). “3-D Histogram Modification of Color Images,” *Proceedings of the International Conference on Image Processing*, Lausanne, Switzerland, vol. 3, pp. 1015-1018.

Mlsna P. A. and Rodriguez J. J. (1995). “A Multivariate Contrast Enhancement Technique for Multispectral Images,” *IEEE Transactions on Geoscience and Remote Sensing*, vol. 33, no. 1, pp. 212-216.

Moenning C. and Dodgson N. A. (2003). “Fast Marching Farthest Point Sampling,” *the 24th Annual EUROGRAPHICS Conference: Posters*, Granada, Spain.

Moffat A., Neal R. M., and Witten I. H. (1998). “Arithmetic Coding Revisited,” *ACM Transactions on Information Systems*, vol. 16, no. 3, pp. 256-294.

Mojsilovic A. (2005). “A Computational Model for Color Naming and Describing Color Composition of Images,” *IEEE Transactions on Image Processing*, vol. 14, no. 5, pp. 690-699.

Morovic J. and Luo M. R. (2001). “The Fundamentals of Gamut Mapping: A Survey,” *Journal of Imaging Science and Technology*, vol. 45, no. 3, pp. 283-290.

Morovic J., Shaw J., and Sun P.-L. (2002). “A Fast, Non-Iterative and Exact Histogram Matching Algorithm,” *Pattern Recognition Letters*, vol. 23, no. 1-3, pp. 127-135.

Morovic J. and Sun P. L. (2002). “Transforming 3D Colour Histograms of Images,” *Proceedings of the First European Conference on Color in Graphics, Imaging and Vision*, Poitiers, France, pp. 104-108.

Morovic J. and Sun P.-L. (2003). “Accurate 3D Image Colour Histogram Transformation,” *Pattern Recognition Letters*, vol. 24, no. 11, pp. 1725-1735.

Morrin T. H. (1974). “A Black-White Representation of a Gray-Scale Picture,” *IEEE Transactions on Computers*, vol. 23, no. 2, pp. 184-186.

Nakamura K., Ohki M., and Totsuka T. (1998). “Image Blending by Feature Overwrite,” *Proceedings of the International Conference on Image Processing*, Chicago, USA, vol. 1, pp. 226-230.

O’Gorman L. and Brotman L. S. (1985). “Entropy-Constant Image Enhancement by Histogram Transformation,” *Applications of Digital Image Processing VIII*, San Diego, USA. Proceedings of SPIE, vol. 575, pp. 106-113.

Ohta Y., Kanade T., and Sakai T. (1980). “Color Information for Region Segmentation,” *Computer Graphics and Image Processing*, vol. 13, no. 3, pp. 221-241.

Oppenheim A., Schafer R., and Stockham T. (1968). "Nonlinear Filtering of Multiplied and Convolved Signals," *Proceedings of the IEEE*, vol. 56, no. 8, pp. 1264-1291.

Ostromoukhov V. (1998). "Mathematical Tools for Computer-Generated Ornamental Patterns," *Electronic Publishing, Artistic Imaging and Digital Typography*, St-Malo, France. Lecture Notes in Computer Science, vol. 1375, pp. 193-223. Proceedings of the 7th International Conference on Electronic Publishing and the 4th International Conference on Raster Imaging and Digital Typography.

Ostromoukhov V. (1999). "Digital Facial Engraving," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 417-424.

Ostromoukhov V., Donohue C., and Jodoin P. M. (2004). "Fast Hierarchical Importance Sampling with Blue Noise Properties," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 488-495.

Ostromoukhov V. and Hersch R. D. (1995). "Artistic Screening," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 219-228.

Ostromoukhov V. and Hersch R. D. (1999). "Multi-Color and Artistic Dithering," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 425-432.

Patera J. (1997). "Non-Crystallographic Root Systems and Quasicrystals," *The Mathematics of Long-Range Aperiodic Order*, edited by R. V. Moody, Proceedings of NATO-ASI, vol. C 489, Kluwer, pp. 443-465.

Pearson D. E. and Robinson J. A. (1985). "Visual Communication at Very Low Data Rates," *Proceedings of the IEEE*, vol. 73, no. 4, pp. 795-812.

Peleg S. (1978). "Iterative Histogram Modification 2," *IEEE Transactions on Systems, Man and Cybernetics*, vol. 8, no. 7, pp. 555-556.

Perez P., Gangnet M., and Blake A. (2003). "Poisson Image Editing," *Proceedings of SIGGRAPH*, San Diego, USA, pp. 313-318.

Perlin K. and Velho L. (1995). "Live Paint: Painting with Procedural Multiscale Textures," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 153-160.

Peyre G. and Cohen L. D. (2003). "Geodesic Remeshing and Parameterization Using Front Propagation," *Proceedings of the IEEE Workshop on Variational, Geometric and Level Set Methods in Computer Vision*, Nice, France, pp. 33-40.

Pichon E., Niethammer M., and Sapiro G. (2003). "Color Histogram Equalization through Mesh Deformation," *Proceedings of the International Conference on Image Processing*, Barcelona, Spain, vol. 2, pp. 117-120.

Pitas I. and Kiniklis P. (1996). "Multichannel Techniques in Color Image Enhancement and Modeling," *IEEE Transactions on Image Processing*, vol. 5, no. 1, pp. 168-171.

Pizer S. M., Amburn E. P., Austin J. D., Cromartie R., Geselowitz A., Greer T., ter Haar Romeny B., Zimmerman J. B., and Zuiderveld K. (1987). "Adaptive Histogram Equalization and Its Variations," *Computer Vision, Graphics, and Image Processing*, vol. 39, no. 3, pp. 355-368.

Pnueli Y. and Bruckstein A. M. (1996). "Gridless Halftoning: A Reincarnation of the Old Method," *Graphical Models and Image Processing*, vol. 58, no. 1, pp. 38-64.

Pocock L. and Rosebush J. (2001). *The Computer Animator's Technical Handbook*, Morgan Kaufmann.

Pointer M. R. and Attridge G. G. (1998). "The Number of Discernible Colours," *Color Research and Application*, vol. 23, no. 1, pp. 52-54.

Poli R. and Cagnoni S. (1997). "Genetic Programming with User-Driven Selection: Experiments on the Evolution of Algorithms for Image Enhancement," *Proceedings of Genetic Programming*, Stanford, USA, pp. 269-277.

Porter T. and Duff T. (1984). "Compositing Digital Images," *Proceedings of SIGGRAPH*, Minneapolis, USA, pp. 253-259.

Press W., Teukolsky S. A., Vetterling W. T., and Flannery B. P. (1992). *Numerical Recipes in C*, 2 ed., Cambridge University Press.

Ragnemalm I. (1992). "Neighborhoods for Distance Transformations Using Ordered Propagation," *CVGIP: Image Understanding*, vol. 56, no. 3, pp. 399-409.

Raji A., Thaibaoui A., Petit E., Bunel P., and Mimoun G. (1998). "A Gray-Level Transformation-Based Method for Image Enhancement," *Pattern Recognition Letters*, vol. 19, no. 13, pp. 1207-1212.

Rangel-Mondragon J. and Abas S. J. (1988). "Computer Generation of Penrose Tilings," *Computer Graphics Forum*, vol. 7, no. 1, pp. 29-37.

Rasche K., Geist R., and Westall J. (2005). "Re-Coloring Images for Gamuts of Lower Dimension," *Proceedings of EUROGRAPHICS*, Dublin, Ireland, pp. 423-432. *Computer Graphics Forum*, vol.24, no.3, pp. 423-432, 2005.

Raskar R., Ilie A., and Yu J. (2004). "Image Fusion for Context Enhancement and Video Surrealism," *Proceedings of the Third International Symposium on Non-photorealistic Animation and Rendering*, Annecy, France, pp. 85-94.

Reese L. J. and Barrett W. A. (2002). "Image Editing with Intelligent Paint," *Proceedings of EUROGRAPHICS: Short Presentations*, Saarbrücken, Germany, pp. 714-723.

Reinhard E., Adhikhmin M., Gooch B., and Shirley P. (2001). "Color Transfer between Images," *IEEE Computer Graphics and Applications*, vol. 21, no. 5, pp. 34-41.

Rila L. (1998). "Image Coding Using Irregular Subsampling and Delaunay Triangulation," *Proceedings of SIBGRAPI*, Rio de Janeiro, Brazil, pp. 167-173.

Robinson J. A. (1995). "Image Coding with Ridge and Valley Primitives," *IEEE Transactions on Communications*, vol. 43, no. 6, pp. 2095-2102.

Robinson J. A. and Ren M. S. (1995). "Data-Dependent Sampling of Two-Dimensional Signals," *Multidimensional Systems and Signal Processing*, vol. 6, no. 2, pp. 89-111.

Rolland J. P., Vo V., Bloss B., and Abbey C. K. (2000). "Fast Algorithms for Histogram Matching: Application to Texture Synthesis," *Journal of Electronic Imaging*, vol. 9, no. 1, pp. 39-45.

Rom H. and Peleg S. (1988). "Image Representation Using Voronoi Tessellation: Adaptive and Secure," *Proceedings of the Conference on Computer Vision and Pattern Recognition*, Ann Arbor, USA, pp. 282-285.

Rosenfeld A. and Davis L. S. (1978). "Iterative Histogram Modification," *IEEE Transactions on Systems, Man and Cybernetics*, vol. 8, no. 4, pp. 300-302.

Rother C., Kumar S., Kolmogorov V., and Blake A. (2005). "Digital Tapestry," *Proceedings of the Conference on Computer Vision and Pattern Recognition*, San Diego USA, vol. 1, pp. 589-596.

Rudaz N., Hersch R. D., and Ostromoukhov V. (1997). "Specifying Color Differences in a Linear Color Space (LEF)," *Proceedings of the Fifth Color Imaging Conference*, Scottsdale, USA, pp. 197-202.

Ruzon M. A. and Tomasi C. (2001). "Edge, Junction, and Corner Detection Using Color Distributions," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 23, no. 11, pp. 1281-1295.

Salembier P., Brigger P., Casas J. R., and Pardas M. (1996). "Morphological Operators for Image and Video Compression," *IEEE Transactions on Image Processing*, vol. 5, no. 6, pp. 881-898.

Salisbury M. P., Anderson S. E., Barzel R., and Salesin D. H. (1994). "Interactive Pen-and-Ink Illustration," *Proceedings of SIGGRAPH*, Orlando, USA, pp. 101-108.

Salisbury M., Anderson C., Lischinski D., and Salesin D. H. (1996). "Scale-Dependent Reproduction of Pen-and-Ink Illustrations," *Proceedings of SIGGRAPH*, New Orleans, USA, pp. 461-468.

Salisbury M. P., Wong M. T., Hughes J. F., and Salesin D. H. (1997). "Orientable Textures for Image-Based Pen-and-Ink Illustration," *Proceedings of SIGGRAPH*, Los Angeles, USA, pp. 401-406.

Sang-Yeon K., Dongil H., Seung-Jong C., and Jong-Seok P. (1999). "Image Contrast Enhancement Based on the Piecewise-Linear Approximation of CDF," *IEEE Transactions on Consumer Electronics*, vol. 45, no. 3, pp. 828-834.

Santella A. and DeCarlo D. (2002). "Abstracted Painterly Renderings Using Eye-Tracking Data," *Proceedings of the Second International Symposium on Non-photorealistic Animation and Rendering*, Annecy, France, pp. 75-82.

Sarfraz M., Al-Mulhem M., and Ashraf F. (1997). "Preserving Monotonic Shape of the Data Using Piecewise Rational Cubic Functions," *Computers and Graphics*, vol. 21, no. 1, pp. 5-14.

Schirillo J. A. (2001). "Tutorial on the Importance of Color in Language and Culture," *Color Research and Application*, vol. 26, no. 3, pp. 179-192.

Schmidhuber J. (1997). "Low-Complexity Art," *Leonardo*, vol. 30, no. 2, pp. 97-103.

Schmitt F. and Chen X. (1991). "Fast Segmentation of Range Images into Planar Regions," *Proceedings of the Conference on Computer Vision and Pattern Recognition*, Maui, USA, pp. 710-711.

Schofield S. (1999). "Non-Photorealistic Rendering - the Artist's Perspective," *Non-Photorealistic Rendering*, edited by S. Green, SIGGRAPH 1999 Course Notes, vol. 17, ACM.

Scott D. W. (1992). *Multivariate Density Estimation: Theory, Practice, and Visualization*, Wiley.

Secord A. (2002). "Weighted Voronoi Stippling," *Proceedings of the Second International Symposium on Non-photorealistic Animation and Rendering*, Annecy, France, pp. 37-43.

Secord A., Heidrich W., and Streit L. (2002). "Fast Primitive Distribution for Illustration," *Proceedings of the EUROGRAPHICS Workshop on Rendering*, Pisa, Italy, pp. 215-226.

Segura J. C., Benitez C., de la Torre A., Rubio A. J., and Ramirez J. (2004). "Cepstral Domain Segmental Nonlinear Feature Transformations for Robust Speech Recognition," *IEEE Signal Processing Letters*, vol. 11, no. 5, pp. 517-520.

Seitz S. M. and Dyer C. R. (1996). "View Morphing," *Proceedings of SIGGRAPH*, New Orleans, USA, pp. 21-30.

Seo S. H., Kang D. W., Park Y. S., and Yoon K. H. (2002). "The New Area Subdivision Methods for Producing Shapes of Colored Paper Mosaic," *Proceedings of the International Conference on Computational Science*, Amsterdam, Holland. Lecture Notes in Computer Science, vol. 2330, pp. 32-41.

Shepard D. (1968). "A Two-Dimensional Interpolation Function for Computer Mapping of Irregularly Spaced Data," *Proceedings of the ACM National Conference*, Las Vegas, USA, pp. 517-524.

Shepard R. N. (1987). "Toward a Universal Law of Generalization for Psychological Science," *Science*, vol. 237, no. 4820, pp. 1317-1323.

Shiraishi M. and Yamaguchi Y. (2000a). "Adaptive Parameter Control for Image Moment-Based Painterly Rendering," *Proceedings of the 9th International Conference on Geometry and Graphics*, Johannesburg, South Africa.

Shiraishi M. and Yamaguchi Y. (2000b). "An Algorithm for Automatic Painterly Rendering Based on Local Source Image Approximation," *Proceedings of the First International Symposium on Non-photorealistic Animation and Rendering*, Annecy, France, pp. 53-58.

Shirley P. (1991). "Discrepancy as a Quality Measure for Sample Distributions," *Proceedings of EUROGRAPHICS*, Vienna, Austria, pp. 183-194.

Shirriff K. (1993). "Generating Fractals from Voronoi Diagrams," *Computers and Graphics*, vol. 17, no. 2, pp. 165-167.

Shvaytser H. and Peleg S. (1983). "Pictures as Elements in a Vector Space," *Proceedings of the Conference on Computer Vision and Pattern Recognition*, Washington, USA, pp. 442-446.

Sibson R. (1981). "A Brief Description of Natural Neighbour Interpolation," *Interpreting Multivariate Data*, edited by V. Barnet, John Wiley & Sons, pp. 21–36.

Sims K. (1991). "Artificial Evolution for Computer Graphics," *Proceedings of SIGGRAPH*, Las Vegas, USA, pp. 319-328.

Sims K. (1993). "Interactive Evolution of Equations for Procedural Models," *Visual Computer*, vol. 9, no. 8, pp. 466-476.

Smith A. R. (1995). "Alpha and the History of Digital Compositing," *Microsoft Tech Memo* 7.

Soong-Der C. and Ramli A. R. (2003a). "Contrast Enhancement Using Recursive Mean-Separate Histogram Equalization for Scalable Brightness Preservation," *IEEE Transactions on Consumer Electronics*, vol. 49, no. 4, pp. 1301-1309.

Soong-Der C. and Ramli A. R. (2003b). "Minimum Mean Brightness Error Bi-Histogram Equalization in Contrast Enhancement," *IEEE Transactions on Consumer Electronics*, vol. 49, no. 4, pp. 1310-1319.

Sousa M. C. (2003). "Indexed Taxonomies of Non-Photorealistic Rendering," *Theory and Practice of Non-Photorealistic Graphics*, edited by M. C. Sousa, SIGGRAPH 2003 Course Notes, vol. 10, ACM.

Sousa M. C. and Buchanan J. (1999). "Observational Model of Blenders and Erasers in Computer-Generated Pencil Rendering," *Proceedings of Graphics Interface*, Kingston, Ontario, pp. 157-166.

Spaulding K. E., Ellson R. N., and Sullivan J. R. (1995). "UltraColor: A New Gamut-Mapping Strategy," *Device-Independent Color Imaging II*, San Jose, USA. Proceedings of SPIE, vol. 2414, pp. 61-68.

Streit L. and Buchanan J. (1998). "Importance Driven Halftoning," *Proceedings of EUROGRAPHICS*, Lisbon, Portugal, pp. C207-C217. *Computer Graphics Forum*, vol. 17, no. 3, pp. C207-C217, 1998.

Strickland R. N., Kim C. S., and McDonnell W. F. (1987). "Digital Color Image Enhancement Based on the Saturation Component," *Optical Engineering*, vol. 26, no. 7, pp. 609-616.

Strothotte C. and Strothotte T. (1997). *Seeing between the Pixels: Pictures in Interactive Systems*, Springer.

Strothotte T. (1998). *Computational Visualization: Graphics, Abstraction, and Interactivity*, Springer.

Strothotte T. and Schlechtweg S. (2002). *Non-Photorealistic Computer Graphics: Modeling, Rendering, and Animation*, Morgan Kaufmann.

Sugihara K. (1999). "Surface Interpolation Based on New Local Coordinates," *Computer Aided Design*, vol. 31, no. 1, pp. 51-58.

Sutherland I. E. (1963). "Sketchpad: A Man-Machine Graphical Communication System," *AFIPS Conference Proceedings: Spring Joint Computer Conference*, Detroit, USA, vol. 23, pp. 329-346.

Szeliski R. (2005). "Image Alignment and Stitching," *Handbook of Mathematical Models in Computer Vision*, edited by N. Paragios, Y. Chen, and O. Faugeras, Springer-Verlag, pp. 275-294.

Sziranyi T. and Toth Z. (2000). "Random Paintbrush Transformation," *Proceedings of the International Conference on Pattern Recognition*, Barcelona, Spain, vol. 3, pp. 151-154.

Takagi H. (2001). "Interactive Evolutionary Computation: Fusion of the Capabilities of EC Optimization and Human Evaluation," *Proceedings of the IEEE*, vol. 89, no. 9, pp. 1275-1296.

Tastl I. and Raidl G. (1998). "Transforming an Analytically Defined Color Space to Match Psychophysically Gained Color Distances," *Color Imaging: Device-Independent Color, Color Hardcopy, and Graphic Arts III*, San Jose, USA. Proceedings of SPIE, vol. 3300, pp. 98-106.

Terrell G. R. (1990). "The Maximal Smoothing Principle in Density Estimation," *Journal of the American Statistical Association*, vol. 85, no. 410, pp. 470-477.

Thompson D. D. and Gonzalez R. C. (1983). "Image Enhancement by Moment Specification," *Proceedings of the 15th Southeastern Symposium on System Theory*, Huntsville, USA, pp. 134-137.

Titterington D. M., Smith A. F. M., and Makov U. E. (1985). *Statistical Analysis of Finite Mixture Distributions*, Wiley.

Toivanen P. J., Vepsalainen A. M., and Parkkinen J. P. S. (1999). "Image Compression Using the Distance Transform on Curved Space (DTOCS) and Delaunay Triangulation," *Pattern Recognition Letters*, vol. 20, no. 10, pp. 1015-1026.

Trahanias P. E. and Venetsanopoulos A. N. (1992). "Color Image Enhancement through 3-D Histogram Equalization," *Proceedings of the International Conference on Pattern Recognition*, The Hague, Netherlands, vol. 3, pp. 545-548.

Treavett S. M. F. and Chen M. (1997). "Statistical Techniques for the Automated Synthesis of Non-Photorealistic Images," *Proceedings of the EUROGRAPHICS UK Conference*, Norwich, UK, pp. 201-210.

Turner M. J. (1996). "Applying Information Theory for Texture Visualisation and Redrawing Art," *Proceedings of the EUROGRAPHICS UK Conference*, London, UK, pp. 113-121.

Unemi T. (1999). "SBART 2.4: Breeding 2D CG Images and Movies and Creating a Type of Collage," *Proceedings of the Third International Conference on Knowledge-Based Intelligent Information Engineering Systems*, Adelaide, Australia, pp. 288-291.

Verghese P. and Pelli D. G. (1992). "The Information Capacity of Visual Attention," *Vision Research*, vol. 32, no. 5, pp. 983-995.

Viggiano J. A. S. and Moroney N. M. (1995). "Color Reproduction Algorithms and Intent," *Proceedings of the Third IS&T/SID Color Imaging Conference*, Scottsdale, USA, pp. 152-154.

Weeks A. R., Sartor L. J., and Myler H. R. (1999). "Histogram Specification of 24-Bit Color Images in the Color Difference (C-Y) Color Space," *Nonlinear Image Processing X*, San Jose, USA. Proceedings of SPIE, vol. 3646, pp. 319-329.

Weszka J. S. and Rosenfeld A. (1979). "Histogram Modification for Threshold Selection," *IEEE Transactions on Systems, Man and Cybernetics*, vol. 9, no. 1, pp. 38-52.

Whitaker R. T. (2000). "A Level-Set Approach to Image Blending," *IEEE Transactions on Image Processing*, vol. 9, no. 11, pp. 1849-1861.

Wolberg G. (1998). "Image Morphing: A Survey," *Visual Computer*, vol. 14, no. 8-9, pp. 360-372.

Wolf R. R. (2001). *Keys to Painting: Color & Value*, North Light.

Wong M. T., Zongker D. E., and Salesin D. H. (1998). "Computer-Generated Floral Ornament," *Proceedings of SIGGRAPH*, Orlando, USA, pp. 423-434.

Xu X. and Miller E. L. (2002). "Entropy Optimized Contrast Stretch to Enhance Remote Sensing Imagery," *Proceedings of the International Conference on Pattern Recognition*, Quebec City, Canada, vol. 3, pp. 915-918.

Yang X. D. (1992). "Adaptive Representation of Histogram Using Interval Tree," *IEE International Conference on Image Processing and its Applications*, Maastricht, Netherlands, pp. 490-493.

Yang X. D., Xiao Q., and Raafat H. (1991). "Direct Mapping between Histograms: An Improved Interactive Image Enhancement Method," *IEEE International Conference on Systems, Man, and Cybernetics*, Charlottesville, USA, vol. 1, pp. 243-247.

Yeong-Taeg K. (1997). "Contrast Enhancement Using Brightness Preserving Bi-Histogram Equalization," *IEEE Transactions on Consumer Electronics*, vol. 43, no. 1, pp. 1-8.

Young-Ho K., Hyun-Suk J., Kun-Sop K., and Byung-Deok N. (1998). "Region-Based Histogram Specification for Dynamic Range Expansion," *Digital Solid State Cameras: Designs and Applications*, San Jose, USA. Proceedings of SPIE, vol. 3302, pp. 90-97.

Yu W., Qian C., and Baeomin Z. (1999). "Image Enhancement Based on Equal Area Dualistic Sub-Image Histogram Equalization Method," *IEEE Transactions on Consumer Electronics*, vol. 45, no. 1, pp. 68-75.

Zamperoni P. (1995). "Image Enhancement," *Advances in Imaging and Electron Physics*, vol. 92, pp. 1-77.

Zhang H. (1996). "Pattern Generation with Color Map Gouraud Shading," *Computers and Graphics*, vol. 20, no. 1, pp. 157-162.

Zhong Z. and Blum R. S. (1999). "A Categorization of Multiscale-Decomposition-Based Image Fusion Schemes with a Performance Study for a Digital Camera Application," *Proceedings of the IEEE*, vol. 87, no. 8, pp. 1315-1326.

Zomet A., Levin A., Peleg S., and Weiss Y. (2006). "Seamless Image Stitching by Minimizing False Edges," *IEEE Transactions on Image Processing*, vol. 15, no. 4, pp. 969-977.